AAUW

QUICK FACTS

Science, Technology, Engineering, and Math (STEM)

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The American Association of University Women supports promoting and strengthening science, technology, engineering, and math (STEM) education, especially for girls and underrepresented populations. Reducing barriers in STEM is a step toward increasing America's global competitiveness.

Workforce projections for 2024 confirm that the top 10 fastest-growing occupations requiring at least a bachelor's degree will need significant science or math training.[1] STEM jobs are expected to grow by 18.7 percent from 2010 to 2020. Non-STEM jobs are expected to grow by 14.3 percent.[2] The supply of new workers in these fields is struggling to match demand, and women remain severely underrepresented.[3]

Before Title IX many opportunities to advance in STEM were denied to women. These included participation in some advanced courses as well as math and science clubs.[4] Today, girls and women have made significant gains, increasing participation in STEM courses particularly in the biological, environmental, and chemical/material sciences.[5] Despite these gains, gender biases remain in STEM at all levels of education and employment. Title IX is an excellent tool to address these issues. However, if we truly intend to meet the needs of the 21st-century economy, we must break down barriers, increase girls' interest in STEM, and encourage more women to pursue STEM careers.

The STEM Labor Market Needs Women

Although women make up nearly half of all employees in the U.S. economy, they hold only 29 percent of STEM jobs.[6] If women and underrepresented groups joined the STEM workforce in proportion to their representation in the overall labor force, the STEM worker shortage would disappear.[7]

Women are particularly underrepresented in the computing and engineering fields, where they represent 26 percent and 12 percent of workers, respectively.[8] Women of color face an even greater lack of representation, black and Hispanic women accounting for only 2 percent of engineers.[9]

Elementary and Secondary Education

Unconscious gender bias is a significant barrier to girls' progress in STEM. Early education plays a critical role for girls' development, setting the stage for their level of interest, confidence, and achievements, particularly in STEM. The messages they receive during their K–12 education play a large role in the decisions and choices students make later in life.[10] But gaps in women's pursuit of STEM fields continue into secondary studies. In 2016, the College Board found that 23 percent of the 58,000 total students who took the AP computer science exam were female. There were no female test takers in Mississippi or Montana.[11]

Slow Progress in College

In 2013–14, 57 percent of undergraduate degree recipients were women,[12] up from 42 percent in 1970.[13] Despite this growth, women's underrepresentation in STEM continues through to their postsecondary studies. In 2012–13, women earned 63 percent of STEM degrees awarded, but the bulk (82 percent) were in health care. Among the "core" STEM fields, which do not include health care, women earned 58 percent of life science degrees, while men earned 87 percent of technician degrees, 80 percent of engineering degrees, and 68 percent of core STEM degrees awarded.[14]

Community colleges offer a range of STEM programs leading to associate degrees and certification, but women remain concentrated in programs for traditionally female occupations like nursing, education, and cosmetology. Women are underrepresented in programs for STEM training such as engineering, computer sciences, and mechanic technologies.[15]

One way to improve this situation is to address challenges that cause girls and women to lose interest in STEM. AAUW research found that school climate

plays a significant role in women's decisions to stay in STEM studies. Stereotypes, gender bias, and the sometimes hostile climate of STEM departments continue to block women's participation and progress.[16]

STEM as a Step toward Pay Equity

In general, women with college degrees earn more than women without, and women with a college degree in STEM earn more. Women with STEM jobs earned 27.7 percent more than comparable women in non-STEM jobs — considerably higher than the STEM wage premium for men. As a result, the gender wage gap is smaller in STEM jobs than in non-STEM jobs. [17]

Improving Opportunities in STEM

There are many ways to increase women's and girls' engagement in STEM:

- Emphasize STEM skills in early education, K–12, and higher education.
- Cultivate girls' achievement by exposing them to female role models in STEM and encouraging high school girls to take calculus, physics, chemistry, computer science, and engineering classes.
- Teacher training must include recognition and avoidance of implicit gender bias, awareness of stereotype threat, techniques to improve spatial skills, and ways to promote a growth mind-set.
- Measure student achievement in STEM disaggregated and cross-tabulated by gender.
- Actively recruit women into STEM majors.
- Enforce Title IX to improve school climates for women and girls.

Additional Resources

Why So Few? Women in Science, Technology, Engineering, and Mathematics
American Association of University Women
www.aauw.org/resource/why-so-few-women-in-science-technology-engineering-and-mathematics

Women in Community Colleges: Access to Success
American Association of University Women
www.aauw.org/research/women-in-community-colleges

Solving the Equation: The Variables for Women's Success in Engineering and Computing
American Association of University Women
www.aauw.org/research/solving-the-equation

You provide the voice; we'll provide the megaphone. Sign up to take action for women and girls today: bit.ly/AAUWActionNetwork.

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[4] Joyce Roché. (2007). *Building on the Success of 35 Years of Title IX.* www.gpo.gov/fdsys/pkg/CHRG-110hhrg35961/pdf/CHRG-110hhrg35961.pdf
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[7] Congressional Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development. (2000). *Land of Plenty: Diversity as America's Competitive Edge in Science, Engineering, and Technology*. www.nsf.gov/pubs/2000/cawmset0409/cawmset_0409.pdf
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[11] The College Board. (2016). *AP Program Participation and Performance Data.* research.collegeboard.org/programs/ap/data/participation/ap-2016
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[14] U.S. Government Accountability Office. (2014). *STEM Education: Assessing the Relationship between Education and the Workforce*. www.gao.gov/assets/670/663079.pdf

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